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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,565	07/11/2003	Jerome Marie Joseph Declerck	KEMP-009	3755

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EXAMINER

COUSO, YON JUNG

ART UNIT PAPER NUMBER

2625

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/618,565

Applicant(s)

JOSEPH DECLERCK ET AL.

Examiner

Yon Couso

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/11/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/27/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 depends from claim 7. Any dependent claim should depend from a claim previously set forth. Please make an appropriate correction.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ivanovic et al "Monte Carlo Simulation Study of Multi-Window Imaging" in view of Woods "MRI-PET Registration with Automated Algorithm".

As to claims 1 and 17-19, Ivanovic teaches a method of registering images of different modalities, comprising: taking a first image of a subject obtained by an imaging

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process of a first modality (emission image in the abstract); taking a second image of the subject obtained by an imaging process of a second modality, said second image having a known positional relationship with the first image (transmission image in the abstract); distinguishing between at least one area of interest and at least one other area not of interest in the second image (figure 1); on the basis of said known positional relationship identifying said at least one area of interest and other area not of interest in the first image (first and second images are inherently registered, therefore, identifying area of interest using positional information is also inherently done, see abstract, lines 4-8). Ivanovic does not teach details on taking a third image of the subject obtained by an imaging process of a third modality and registering the first and third images by an image matching process based on said at least one area of interest identified in the first image. However, it is noted that there is no processing performed between the second image and the third image. First processing is performed between the first and second image and then the second processing is performed between the first and third image in the claimed invention. There are numerous articles and patents in the field on various modalities involved in the registration (see A Survey of Medical Image Registration by J. B. Antoine Mainz et al, 1997). Woods teaches a method of registering images of different modalities, by taking a first image of a subject obtained by an imaging process of a first modality (PET image), taking a third image of the subject obtained by an imaging process of a third modality (MRI image) and registering the first and third images by an image matching process based on said at least one area of interest identified in the first image (page 537, column 2, fifth full paragraph). Moreover, Woods

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also discloses PET-to-PET image registration under Objective. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine Ivanovic and Woods references to perform two known image registrations, namely, PET emission-PET transmission registration and MRI-PET registration. As evidenced by the Ivanovic and Woods, both techniques were well-known at the time the invention was made, mere combination of the two registrations would have been obvious to one of ordinary skill in the art.

As to claim 2, Woods teaches at least one other area not of interest comprises image of background outside the subject (page 537, column 1, lines 42-44).

As to claim 3, Woods teaches setting the image intensities of the identified at least one other area not of interest to a constant value prior to conducting said matching process (page 537, column 2, lines 34-36).

As to claim 4, Woods teaches that the constant value is zero or one (page 537, column 2, lines 34-36).

As to claim 5, Ivanovic teaches the first and second images are obtained on the same imaging apparatus thus providing said known positional relationship (abstract, lines 4-9).

As to claim 6, Ivanovic teaches that the first and second images are inherently registered (abstract, lines 4-9).

As to claim 7, Ivanovic teaches that the first image is an emission image in which intensity values are related to function in the subject (emission image taught throughout the reference).

As to claim 8, Ivanovic teaches that the second image is a transmission image obtained by transmitting imaging radiation through the subject from one side to the other, the intensity values being related to attenuation and scattering of the radiation by the structure of the subject (transmission image taught throughout the reference).

As to claim 9, Woods teaches that the third image is a detailed structural image of the subject (MRI).

As to claim 10, Woods teaches registering the first and third images comprises deriving a positional transformation mapping to each other areas identified in said matching process as corresponding to each other (page 537, column 2, fifth full paragraph).

As to claim 11, Woods teaches that the matching process comprises matching intensities of said at least one area of interest of the first image with areas in said third image to identify corresponding areas.

As to claim 12, Woods teaches that the intensities in said first image are corrected for attenuation in the subject by means of the second image before said matching process is conducted.

As to claim 13, Woods teaches that the intensities in said first image subjected to an enhancement process before said matching process is conducted.

As to claim 14, Ivanovic teaches that at least one of the first and second images is a nuclear medicine image (abstract, lines 1-8).

As to claim 15, Ivanovic teaches that the first image is a nuclear medicine image showing the presence of a radioactive marker in the body of the subject (inherent to the

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radionuclide imaging).

As to claim 16, Woods teaches that the third image is a medical image MRI image of a brain).

As to claim 17, Ivanovic teaches displaying the first and third images superposed in registration with each other on the display (figure 1).

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

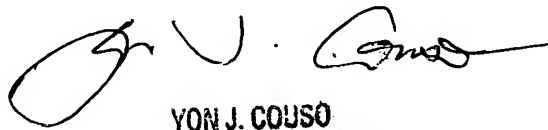
Weese et al, Shao et al, Townsend et al, and Oosawa are also cited.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yon Couso whose telephone number is (571) 272-7448. The examiner can normally be reached on Monday through Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YJC  
April 22, 2005



YON J. COUSO  
PRIMARY EXAMINER